

## General Description

Series D101VW directional control valves are 5-chamber, pilot operated, solenoid controlled valves. They are available in 2 or 3-position styles. These valves are manifold or subplate mounted, and conform to NFPA's D10, CETOP 10 mounting pattern.





## Operation

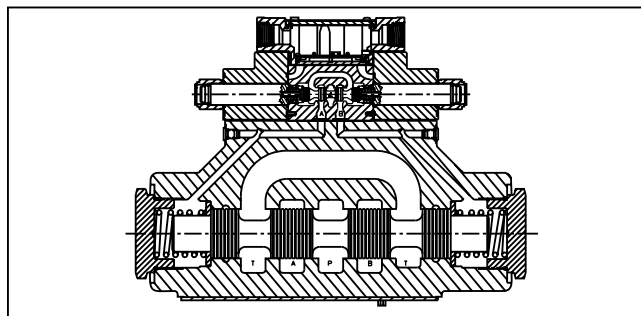
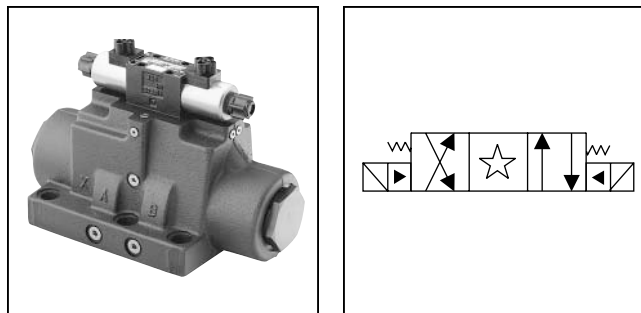
Series D101VW pilot operated valves are standard with low shock spools and pilot orifice. The orifice can be removed if a faster shift is required. However, it is recommended that all systems operating above 138 Bar (2000 PSI) use the standard valve to avoid severe shock.

## Features

- Low pressure drop design
- Hardened spools provide long life
- Fast response option available
- Wide variety of voltages and electrical connection options
- Explosion proof availability
- No tools required for coil removal

## Specifications

<b>Mounting Pattern</b>	NFPA D10 , CETOP 10, NG32
<b>Maximum Operating Pressure</b>	207 Bar (3000 PSI) Standard CSA  207 Bar (3000 PSI)
<b>Maximum Tank Line Pressure</b>	Internal Drain Model: 102 Bar (1500 PSI) AC Only 207 Bar (3000 PSI) DC Standard/AC Optional External Drain Model: 207 Bar (3000 PSI) CSA  102 Bar (1500 PSI)
<b>Maximum Drain Pressure</b>	102 Bar (1500 PSI) AC Only 207 Bar (3000 PSI) DC Standard/AC Optional CSA  102 Bar (1500 PSI)
<b>Minimum Pilot Pressure</b>	4.4 Bar (65 PSI)
<b>Maximum Pilot Pressure</b>	207 Bar (3000 PSI) Standard CSA  207 Bar (3000 PSI)
<b>Nominal Flow</b>	378 LPM (100 GPM)
<b>Maximum Flow</b>	See Reference Chart



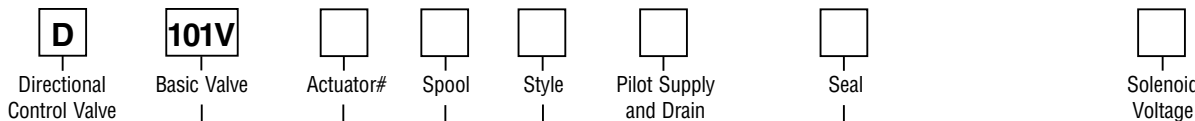
## Response Time

Response times (milliseconds) are measured at 205 Bar (3000 PSI) and 416 LPM (110 GPM) with various pilot pressures as indicated.

Solenoid Type	Pilot Pressure	Pull-In		Drop-Out	
		Std	Fast	Std	Fast
DC	500	180	170	195	195
	1000	130	125	195	195
	2000	100	95	195	195
AC	500	140	130	185	185
	1000	90	85	185	185
	2000	60	55	185	185

Because of the high drain line pressure transients generated during shifting, use of the fast response option is not recommended for pilot pressures exceeding 205 Bar (2000 PSI).

**A**



NFPA D10  
 CETOP 10  
 DIN NG32  
 D03 Pilot

Code	Description
W	Solenoid, Wet Pin, Screw-in
HW	Reversed Wiring

Code	Description
N	Nitrile
V	Fluorocarbon

Code	Description
A**	24/50 VAC
D	120 VDC
G	198 VDC
J	<b>24 VDC</b>
K	<b>12 VDC</b>
N***	220/50 VAC
P***	110/50
Q**	100/60 VAC
R	24/60 VAC
T	<b>240/60 - 220/50 VAC</b>
U	98 VDC
Y	<b>120/60 - 110/50 VAC</b>
Z	250 VDC

# Valve schematic symbols are per NFPA/ANSI standards, providing flow P to A when energizing solenoid A. Note operators reverse sides for #008 and #009 spools. See installation information for details. To configure per DIN standards (A coil over A port, B coil over B port) code valves as D101VHW\*\*\*.

Code	Description
1	<b>Internal Pilot, External Drain</b>
2	<b>External Pilot, External Drain</b>
3†	Internal Pilot w/Check, External Drain
4*	<b>Internal Pilot, Internal Drain</b>
5	<b>External Pilot, Internal Drain</b>
6†	Internal Pilot w/Check Internal Drain

\* Not available with 002, 007, 008 & 009 spools.  
 † #3 and #6 bodies cannot be converted to other styles. Other pilot versions cannot be converted to styles 3 and 6.

\*\* High watt only.  
 \*\*\* Explosion proof only.

Code	Symbol	Code	Symbol
001		006	
002		007	
003		008*	
004		009**	
005		011	
		012	

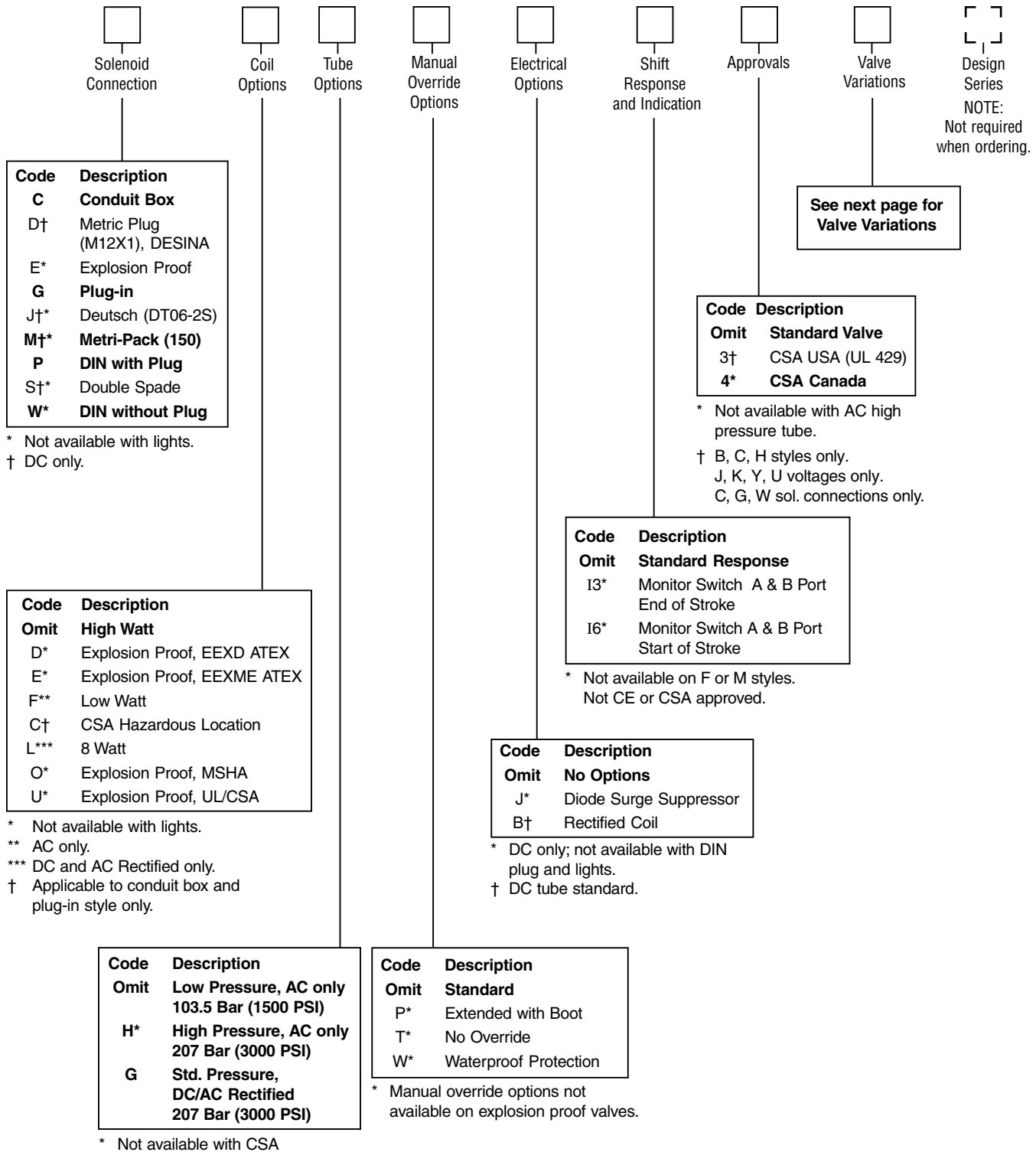
\* 008 spool has closed crossover.  
 \*\* 009 spool has open crossover.

Code	Description	Symbol
<b>B*</b>	<b>Single solenoid, 2 position, spring offset. P to A and B to T in offset position.</b>	
<b>C</b>	<b>Double solenoid, 3 position, spring centered.</b>	
<b>D*</b>	<b>Double solenoid, 2 position, detent.</b>	
E	Single solenoid, 2 position, spring centered. P to B and A to T when energized.	
F†	Single solenoid, 2 position, spring offset, energized to center. Spacer on A side. P to A and B to T in offset position.	
<b>H*</b>	<b>Single solenoid, 2 position, spring offset. P to B and A to T in offset position.</b>	
K	Single solenoid, 2 position, spring centered. P to A and B to T when energized.	
M†	Single solenoid, 2 position, spring offset, energized to center. Spacer on B side. P to B and A to T in offset position.	

\* Available with 001, 002, 004 & 011 spools.  
 † High watt only.

**Bold: Designates Tier I products and options.**

**Non-Bold: Designates Tier II products and options. These products will have longer lead times.**



**Valve Weight:** Double Solenoid 19.6 kg (43.2 lbs.)  
**Standard Bolt Kit:** BK228  
**Metric Bolt Kit:** BKM228

**Bold: Designates Tier I products and options.**

**Non-Bold: Designates Tier II products and options. These products will have longer lead times.**

**Valve Variations**

**A**

Code	Description	D31*W	D61*W	D81*W	D101*W
5	Signal Lights				
6	Manaplug – Brad Harrison Mini				
56	Manaplug (Mini) with Lights				
7A	Manaplug – Brad Harrison (12x1) Micro				
7B	Manaplug (Micro) with Lights (D1 only)				
20	Fast Response				
1A	Manaplug (Mini) Single Sol. 5-pin				
1B	Manaplug (Micro) Single Sol. 5-pin				
1C	Manaplug (Mini) Single Sol. 5-pin, with Lights				
1D	Manaplug (Micro) Single Sol. 5-pin, with Lights				
1E	Manaplug (Mini) Single Sol. 5-pin, with Stroke Adjust "A" & "B" End				
1F	Manaplug (Micro) Single Sol. 5-pin, with Stroke Adjust "A" & "B" End				
1G	Manaplug (Mini) Single Sol. 5-pin, with Stroke Adjust "A" & "B" End and Lights				
1H	Manaplug (Micro) Single Sol. 5-pin, with Stroke Adjust "A" & "B" End and Lights				
1M	Manaplug Opposite of Normal				
1P	Painted Body				
3A	Pilot Choke Meter Out				
3B	Pilot Choke Meter In				
3C	Pilot Pressure Reducer				
3D	Stroke Adjust "B" End				
3E	Stroke Adjust "A" End				
3F	Stroke Adjust "A" & "B" End				
3G	Pilot Choke Meter Out with Lights				
3H	Pilot Choke Meter In with Lights				
3J	Pilot Pressure Reducer with Lights				
3K	Pilot Choke Meter Out with Stroke Adjust "A" & "B" End				
3L	Pilot Choke Meter Out, Stroke Adjust "A" & "B" End with Lights and Manaplug (Mini)				
3M	Pilot Choke Meter Out, Pilot Pressure Reducer, Stroke Adjust "A" & "B" End				
3R	Pilot Choke Meter Out and Pilot Pressure Reducer				
3S	Pilot Choke Meter Out with Lights and Manaplug (Mini)				
3W	Manaplug (Mini) 5-pin with Stroke Adjust "A" & "B" End and Lights				
4B	Protection Cap for Monitor Switch				
4D*	Twist & Lock Override (Old 5426)				
4E*	Push Manual Override (Old x5450)				

gray = available; white= not available

\* DC/AC Rectified only. Not available with explosion proof.



**Reference Data**

Model	Spool Symbol	Maximum Flow, LPM (GPM) 205 Bar (3000 PSI) w/o Malfunction	Model	Spool Symbol	Maximum Flow, LPM (GPM) 205 Bar (3000 PSI) w/o Malfunction
D101V*001		946 (250)	D101V*006		946 (250)
D101V*002		946 (250)	D101V*007		303 (80)
D101V*003		946 (250)	D101V*008		492 (130)
D101V*004		946 (250)	D101V*009		
D101V*005		946 (250)	D101V*011		946 (250)

See Universal Spool Chart for additional spool options.

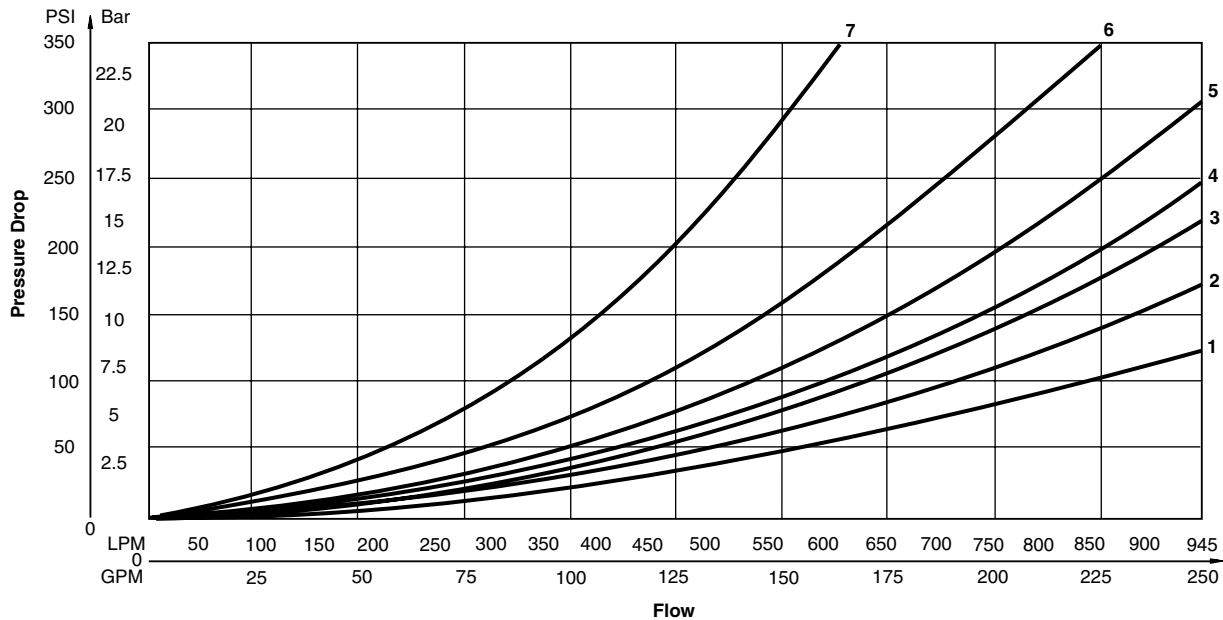
**D101VW Series Pressure Drop Chart**

The following chart provides the flow vs. pressure drop curve reference for the Series D101VW valve by spool type.

VISCOSITY CORRECTION FACTOR							
Viscosity (SSU)	75	150	200	250	300	350	400
% of ΔP (Approx.)	93	111	119	126	132	137	141
Curves were generated using 100 SSU hydraulic oil. For any other viscosity, pressure drop will change as per chart.							

D101VW Pressure Drop Reference Chart -- Curve Number					
Spool No.	P-A	P-B	P-T	A-T	B-T
001	4	4	-	2	3
002	3	3	3	1	2
003	4	4	-	1	3
004	4	4	-	1	2
005	3	4	-	2	3
006	3	3	-	2	3
007	4	3	7	2	2
008/009	5	5	6	2	3
011	4	4	-	2	3

**Performance Curves**



2502-A6.p65, dd

**Solenoid Ratings**

<b>Insulation System</b>	Class F
<b>Allowable Deviation from rated voltage</b>	-10% to +15% for DC and AC rectified coils -5% to +5% for AC Coils
<b>Armature</b>	Wet pin type
<b>CSA File Number</b>	LR60407
<b>Environmental Capability</b>	DC Solenoids meet NEMA 4 and IP67 when properly wired and installed. Contact HVD for AC coil applications.

**Explosion Proof Solenoid Ratings\***

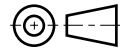
<b>UL &amp; CSA (EU)</b>	Class I, Div 1 & 2, Groups C & D Class II, Div 1 & 2, Groups E, F & G As defined by the NEC
<b>MSHA (EO)</b>	Complies with 30CFR, Part 18
<b>ATEX (ED)</b>	Complies with ATEX requirements for: Exd, Group IIB; EN50014: 1999+ Amds. 1 & 2, EN50018: 2000
<b>CSA Hazardous Location</b>	Class II, Div 1 & 2, Groups E, F & G

\* Allowable Voltage Deviation ±10%.  
 Note that Explosion Proof AC coils are single frequency only.

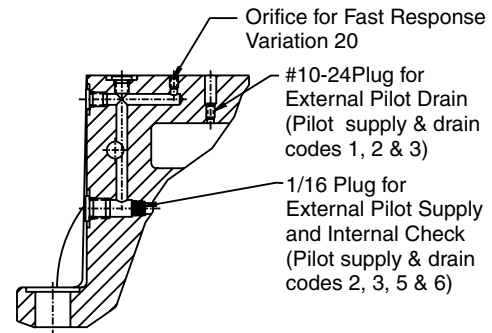
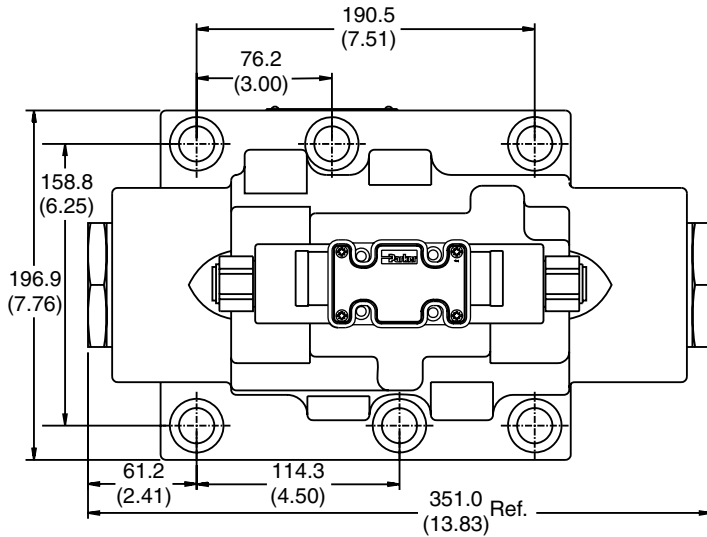
Code		Voltage	In Rush Amps Amperage	In Rush Amps D101VW VA @ 3MM	Holding Amps D101VW	Watts D101VW	Resistance D101VW
Voltage Code	Power Code						
<b>A</b>		24/50 VAC, High Watt	7.00 Amps	168 VA	2.65 Amps	28 W	1.67 ohms
<b>D</b>	<b>L</b>	120 VDC	N/A	N/A	0.09 Amps	10 W	1584.00 ohms
			N/A	N/A	0.26 Amps	30 W	528.00 ohms
<b>G</b>	<b>L</b>	198 VDC	N/A	N/A	0.05 Amps	10 W	3920.40 ohms
			N/A	N/A	0.15 Amps	30 W	1306.80 ohms
<b>J</b>	<b>L</b>	24 VDC	N/A	N/A	0.44 Amps	10 W	51.89 ohms
			N/A	N/A	1.32 Amps	30 W	17.27 ohms
<b>K</b>	<b>L</b>	12 VDC	N/A	N/A	0.88 Amps	10 W	12.97 ohms
			N/A	N/A	2.64 Amps	30 W	4.32 ohms
<b>L</b>	<b>L</b>	6 VDC	N/A	N/A	1.67 Amps	10 W	3.59 ohms
			N/A	N/A	5.00 Amps	30 W	1.20 ohms
<b>Q</b>		100 VAC / 60 Hz	1.7 Apms	170 VA	0.56 Amps	24 W	26.0 ohms
<b>QD</b>		100 VAC / 60 Hz	0.41 Amps	135 VA	0.41 Amps	18 W	31.2 ohms
<b>QD</b>		100 VAC / 50 Hz	0.57 Amps	150 VA	0.57 Amps	24 W	31.2 ohms
<b>R</b>		24/60 VAC, High Watt	8.00 Amps	192 VA	2.70 Amps	27 W	1.40 ohms
	<b>F</b>	24/60 VAC, Low Watt	6.67 Amps	160 VA	2.20 Amps	23 W	1.52 ohms
<b>T</b>		240/60 VAC, High Watt	0.77 Amps	185 VA	0.26 Amps	25 W	134.50 ohms
		220/50 VAC, High Watt	0.82 Amps	180 VA	0.31 Amps	27 W	134.50 ohms
	<b>F</b>	240/60 VAC, Low Watt	0.70 Amps	168 VA	0.22 Amps	21 W	145.00 ohms
	<b>F</b>	220/50 VAC, Low Watt	0.75 Amps	165 VA	0.26 Amps	23 W	145.00 ohms
<b>U</b>	<b>L</b>	98 VDC	N/A	N/A	0.10 Amps	10 W	960.00 ohms
<b>Y</b>		120/60 VAC, High Watt	1.55 Amps	186 VA	0.49 Amps	25 W	33.70 ohms
		110/50 VAC, High Watt	1.65 Amps	182 VA	0.58 Amps	27 W	33.70 ohms
	<b>F</b>	120/60 VAC, Low Watt	1.40 Amps	168 VA	0.42 Amps	21 W	36.50 ohms
	<b>F</b>	110/50 VAC, Low Watt	1.50 Amps	165 VA	0.50 Amps	23 W	36.50 ohms
<b>Z</b>	<b>L</b>	250 VDC	N/A	N/A	0.04 Amps	10 W	6875.00 ohms
			N/A	N/A	0.13 Amps	30 W	1889.64 ohms
<b>Explosion Proof Solenoids</b>							
<b>R</b>		24/60 VAC	7.63 Amps	183 VA	2.85 Amps	27 W	1.99 ohms
<b>T</b>		240/60 VAC	0.76 Amps	183 VA	0.29 Amps	27 W	1.34 ohms
<b>N</b>		220/50 VAC	0.77 Amps	169 VA	0.31 Amps	27 W	1.38 ohms
<b>Y</b>		120/60 VAC	1.60 Amps	192 VA	0.58 Amps	27 W	33.50 ohms
<b>P</b>		110/50 VAC	1.47 Amps	162 VA	0.57 Amps	27 W	34.70 ohms
<b>Q</b>		100/60 VAC	1.90 Amps	192 VA	0.70 Amps	27 W	38.60 ohms
<b>K</b>		12 VDC	N/A	N/A	2.75 Amps	33 W	4.36 ohms
<b>J</b>		24 VDC	N/A	N/A	1.38 Amps	33 W	17.33 ohms
<b>D</b>		120 VDC	N/A	N/A	0.28 Amps	33 W	420.92 ohms
<b>Z</b>		250 VDC	N/A	N/A	0.13 Amps	33 W	1952.66 ohms

Inch equivalents for millimeter dimensions are shown in (\*\*)

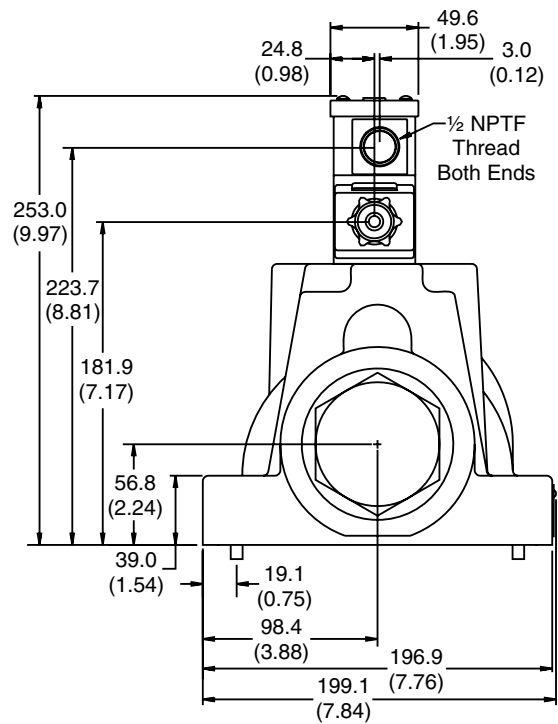
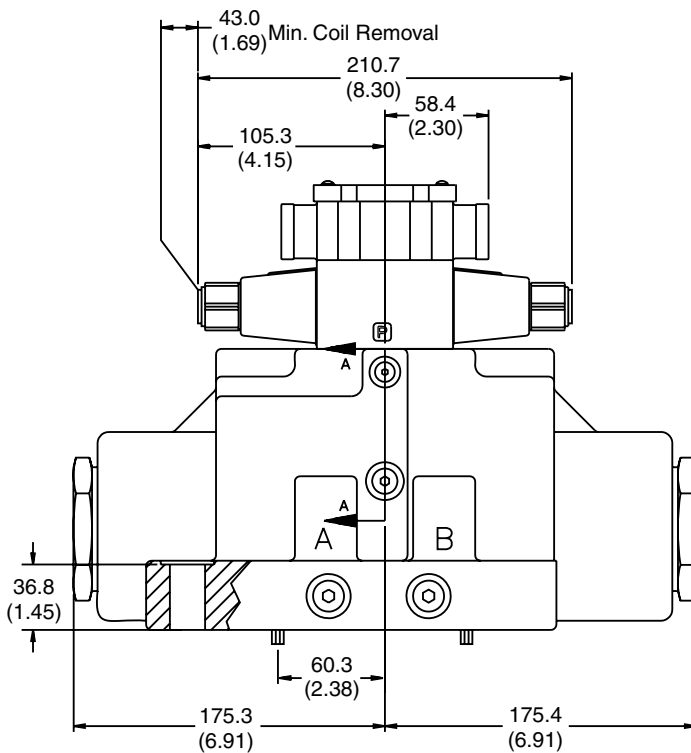
**Conduit Box, Double AC Solenoid**



**A**



SECTION A-A

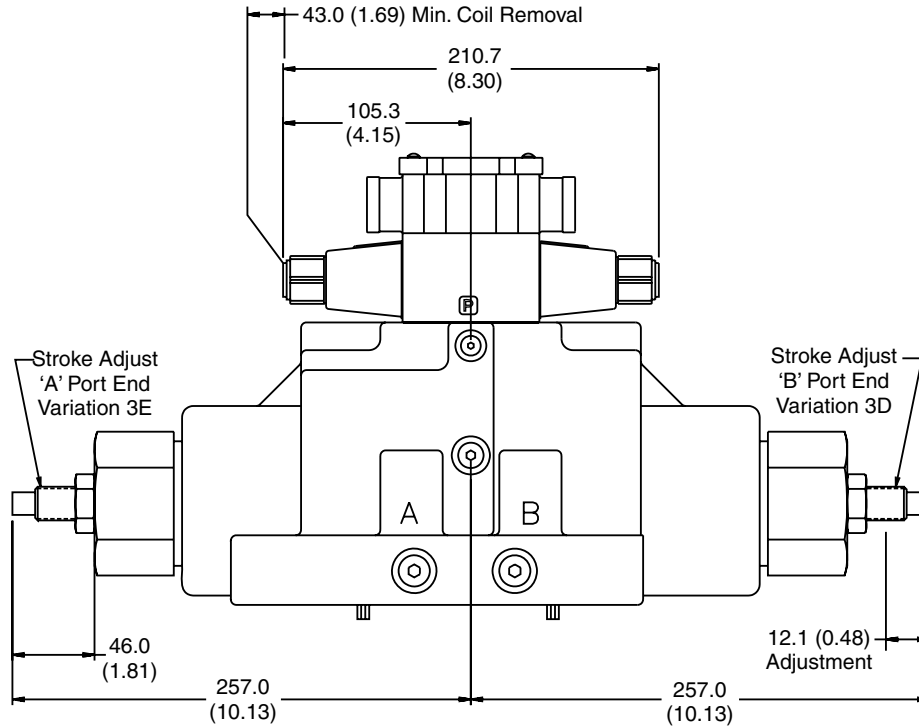


**Note:** 36.83mm (1.45") from bottom of bolt hole counterbore to bottom of valve.

Inch equivalents for millimeter dimensions are shown in (\*\*)

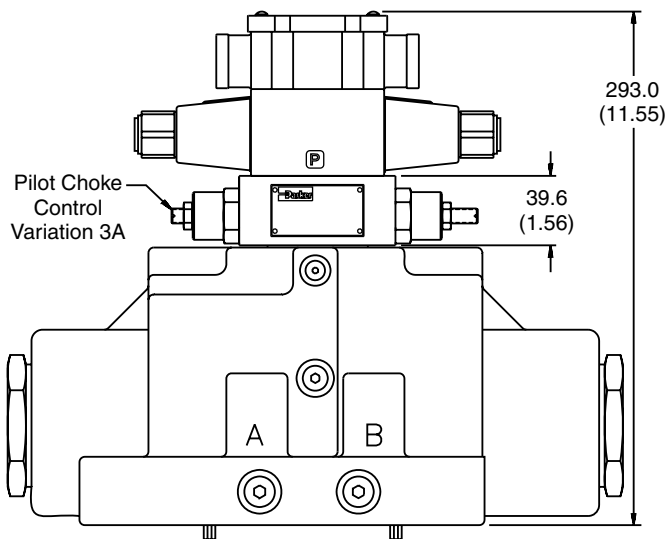


**Conduit Box and Stroke Adjust, Double AC Solenoid**



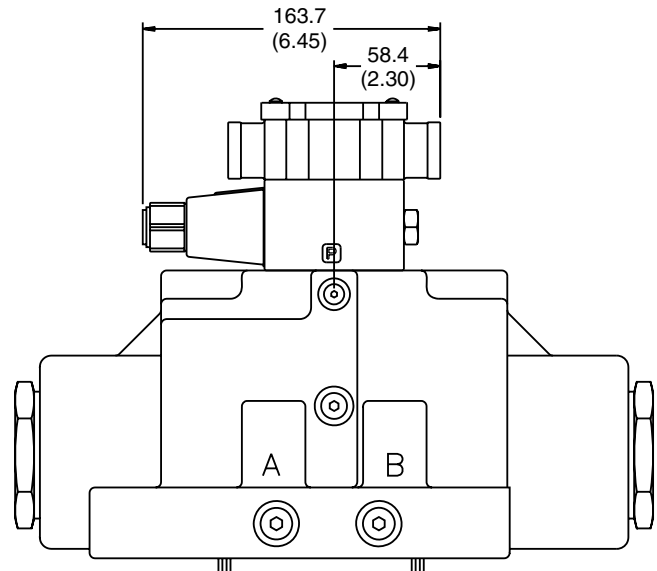
**Note:** 36.83mm (1.45") from bottom of bolt hole counterbore to bottom of valve.

**Conduit Box and Pilot Choke Control,  
Double AC Solenoid**



**Note:** 36.83mm (1.45") from bottom of bolt hole counterbore to bottom of valve.

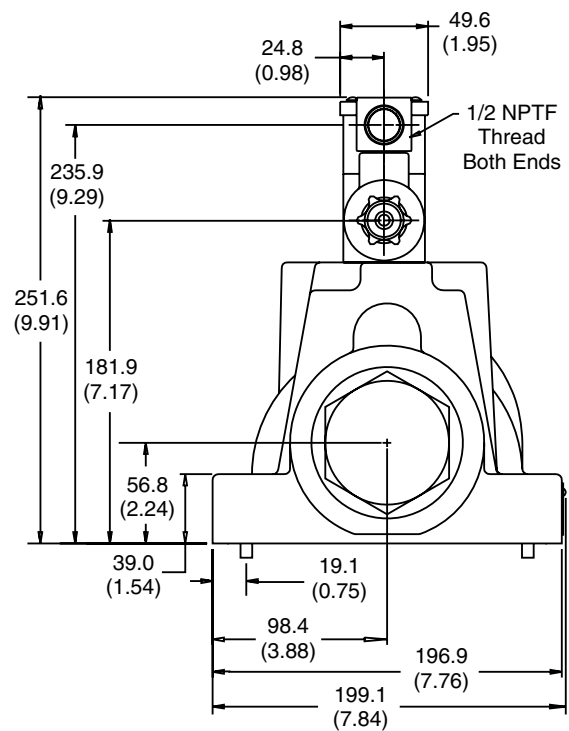
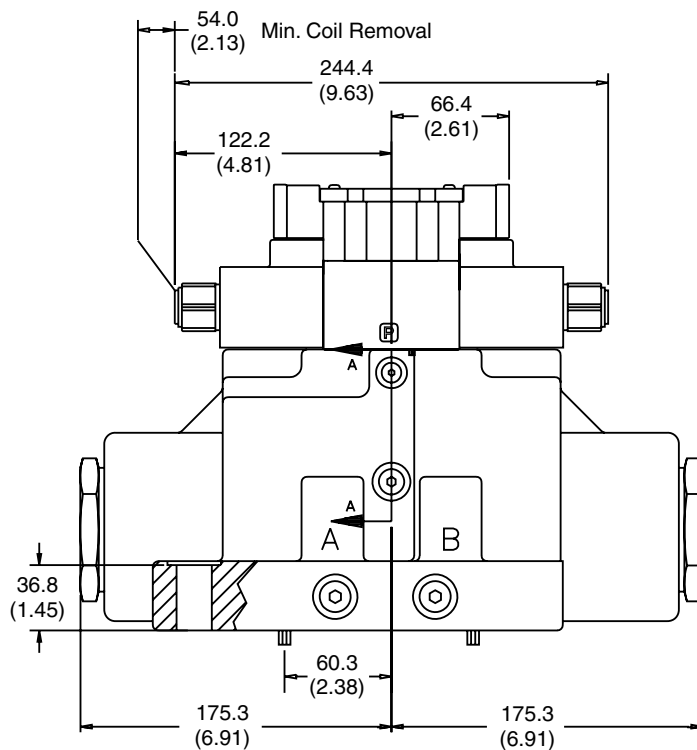
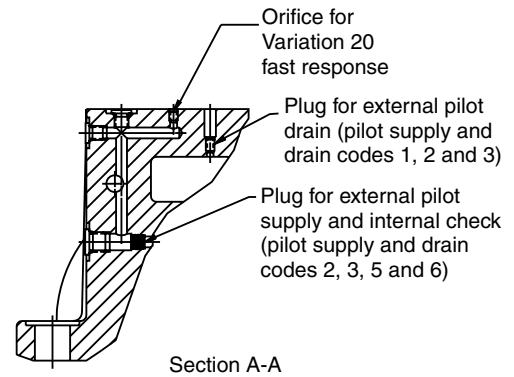
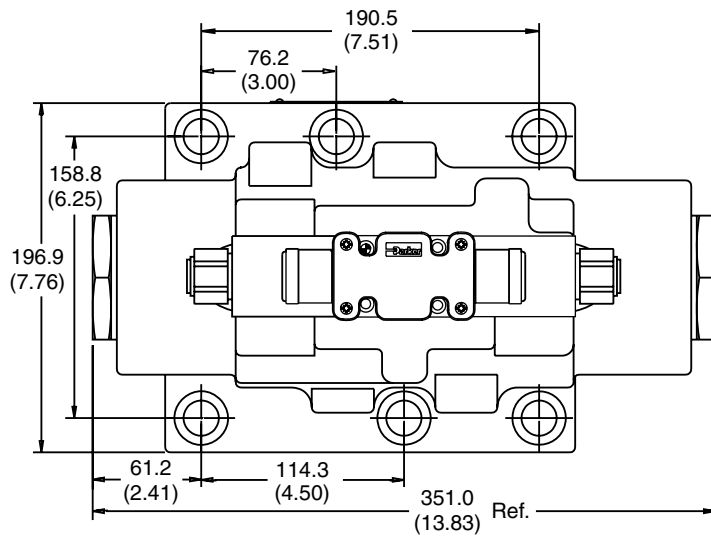
**Conduit Box, Single AC Solenoid**





Inch equivalents for millimeter dimensions are shown in (\*\*)

**Plug-in Conduit Box, Double DC Solenoid**

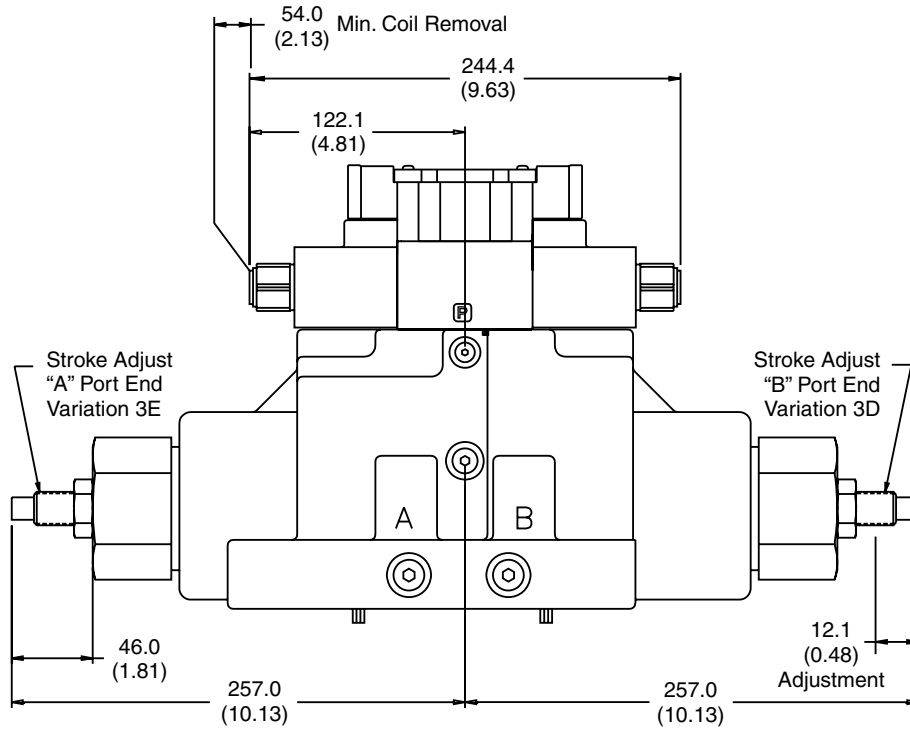


**Note:** 36.83mm (1.45") from bottom of bolt hole counterbore to bottom of valve.

Inch equivalents for millimeter dimensions are shown in (\*\*)

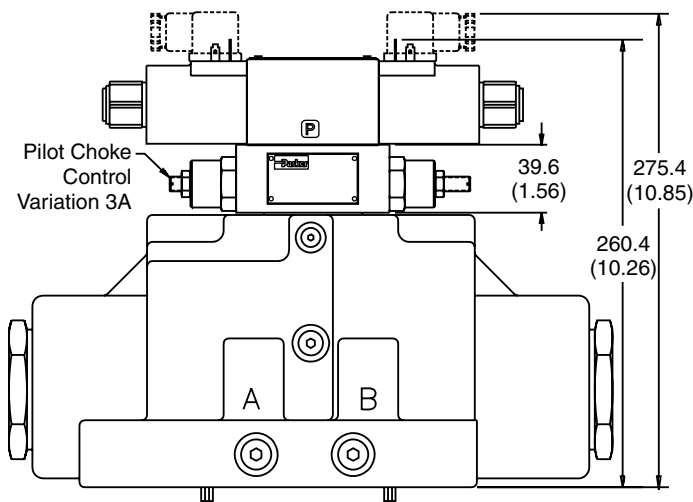


**Plug-in Conduit Box and Stroke Adjust, Double DC Solenoid**



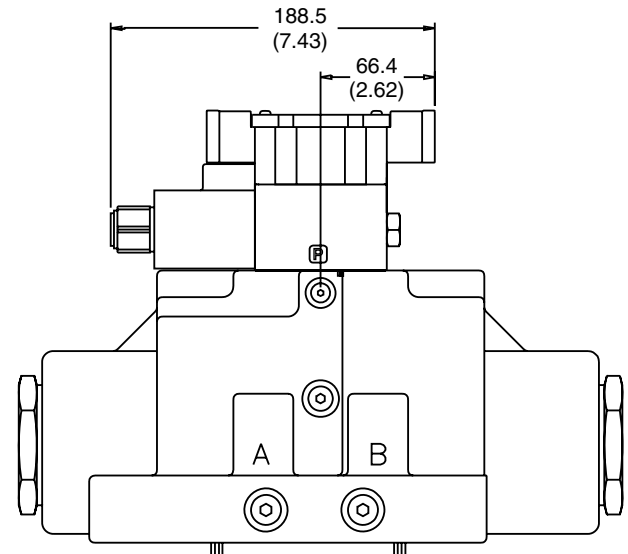
**Note:** 36.83mm (1.45") from bottom of bolt hole counterbore to bottom of valve.

**Hirschmann and Pilot Choke Control,  
Double DC Solenoid**



**Note:** 36.83mm (1.45") from bottom of bolt hole counterbore to bottom of valve.

**Plug-in Conduit Box, Single DC Solenoid**



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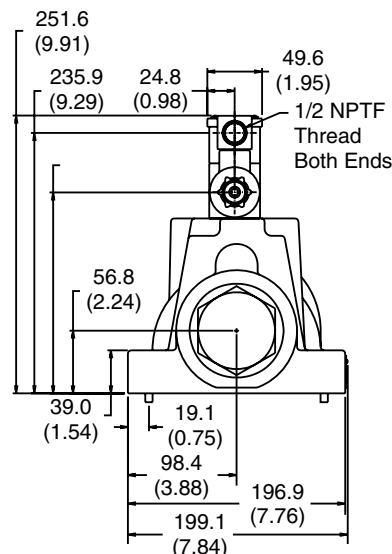
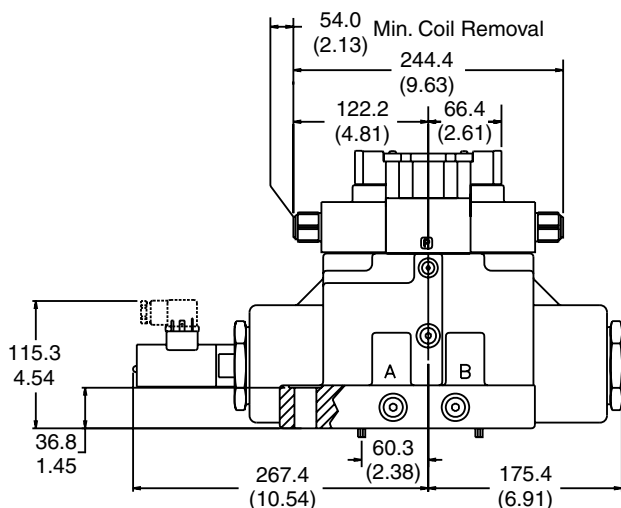
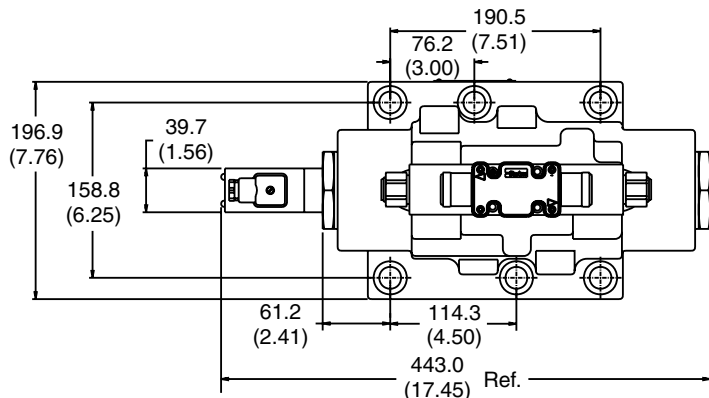
**Dimensions**

Inch equivalents for millimeter dimensions are shown in (\*\*)

**Plug-in Conduit Box, Double DC Solenoid  
with Variation I3 or I6 (Monitor Switch)**



**A**



**Monitor Switch  
(valve variation I3 and I6)**

This feature provides for electrical confirmation of the spool shift. This can be used in safety circuits, to assure proper sequencing, etc.

**Switch Data**

Pin 1 and Pin 3 have outputs equal to the input. When the monitor switch has the output to Pin 1, Pin 3 will have an output of zero, and vice-versa. When the valve is switched, Pin 1 and Pin 3 will switch outputs.

